

**Amendments to the Claims**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

24. (currently amended) An image processing apparatus for processing imaging data in a plurality of spectral bands and fusing the data into a color image, comprising:

one or more imaging sensors;

at least three image-acquiring sensor areas located on said one or more imaging sensors, wherein each said sensor area is sensitive to a different spectral band than at least one other of said sensor areas and generates an image output representative of an acquired image in the spectral band to which the sensor area is sensitive;

a frame grabber connected to said imaging sensors;

an operator interface configured for displaying diagnostic information; and

a general purpose computer connected to said imaging sensors for executing in real time

a registration algorithm for scaling and registering said image outputs executed;

and

a color fusion algorithm for combining said image outputs into a single image.

Inventors: Warren et al.  
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Claim 25 (cancelled)

Claim 26 (cancelled)

27. (previously presented) The apparatus of claim 24, wherein said color fusion algorithm is simple color fusion, whereby each said sensor area image output is separately assigned to a different display color based on wavelength.

28. (previously presented) The apparatus of claim 24, wherein said color fusion algorithm is based on principle component color fusion, whereby said sensor area outputs are fused into one image.

29. (previously presented) The apparatus of claim 28, wherein said principle component color fusion de-saturates said fused output image.

Claim 30 (cancelled)

31. (currently amended) The apparatus of claim 24, wherein said one or more imaging sensors comprise three sensors, and each said sensor is configured to map its image to an

associated color channel. and wherein said algorithm is configured to combine said color channels into a color image.

32. (previously presented) The apparatus as in claim 31, wherein said three sensors are respectively sensitive to any combination of visible, near infrared (NIR), short-wave infrared (SWIR), mid-wave infrared (MWIR), long-wave infrared (LWIR) spectral bands.

33. (currently amended) A method for producing a real-time color fused image, comprising the steps of:

providing one or more imaging sensors including at least three image-acquiring sensor areas located on said one or more imaging sensors. wherein each said sensor area is sensitive to a different spectral band than at least one other of said sensor areas;

exposing said at least three sensor-areas to an image, said at least three sensor areas thereby each acquiring said image and generating an image output representative of said acquired image in the spectral band to which the sensor area is sensitive;

providing a frame grabber for acquiring said image;

scaling said image outputs of said sensor areas;

providing a computer for executing a color fusion algorithm and a registration algorithm;  
registering said image outputs; [[and]]

color fusing said image outputs into a single image; and

displaying diagnostic information.

Claim 34 (cancelled)

Claim 35 (cancelled)

36. (previously presented) The method as in claim 33, wherein said color fusing algorithm is simple color fusion whereby each said sensor area image output is separately assigned to a different display color based on wavelength.

37. (previously presented) The method as in claim 33, wherein said color fusing is based on principle component color fusion whereby said sensor area outputs are fused into one image.

38. (previously presented) The method as in claim 33, wherein said image is acquired by three sensors, each said sensor is configured to map its image to an associated color channel, and wherein said fusing combines said color channels into a color image.

39. (previously presented) The method as in claim 33, wherein said three sensors are respectively sensitive to any combination of visible, near infrared (NIR), short-wave infrared (SWIR), mid-wave infrared (MWIR), long-wave infrared (LWIR) spectral bands.

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40. (previously presented) The method as in claim 33, wherein said processing and fusing of said image occurs in real time.